

DIII-D FY2006 Target #161: Inject 2 MW of neutral beam power in the counter direction on DIII-D and begin physics experiments.

Fourth Quarter Milestone: Inject 2 MW of deuterium neutrals into plasma from the modified beamline and begin physics experiments. (September 30, 2006)

This quarterly target was completed on September 7, 2006

- 5 MW of deuterium neutrals were injected on May 22, 2006
 - See Fig. 1: discharge showing 5 MW injection
- Experiments using co plus counter neutral beam capability began on June 6, 2006
- Experiments using co plus counter neutral beam injection in the 2006 experimental campaign include:
 - Simultaneous feedback control of stored energy and rotation
 - CER measurements using co and counter beams to verify CX cross section effects on CER measurements
 - Resistive wall mode (RWM) studies at low rotation
 - Study of rotation effects in advanced tokamak and hybrid discharges
 - Control of edge density in QH-mode plasmas by varying edge rotation
 - Effects of rotation on ELM suppression using resonant magnetic perturbations
 - Effect of fast ion parallel flow on Alfvén modes
- To date, the RWM studies have had the greatest impact
 - The rotation threshold for RWM stabilization discovered to be more than a factor of two smaller than previously observed (Fig. 2)
 - This is excellent news for ITER

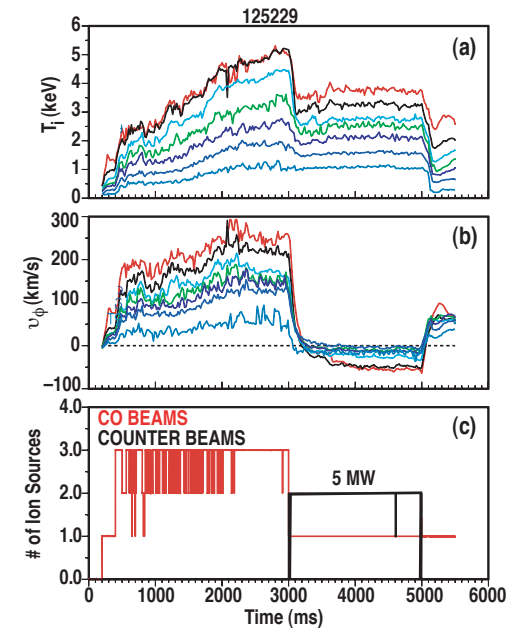


Fig. 1: (a) Ion temperature and (b) rotation velocity profile evolution in a discharge with 5 MW of counter injection

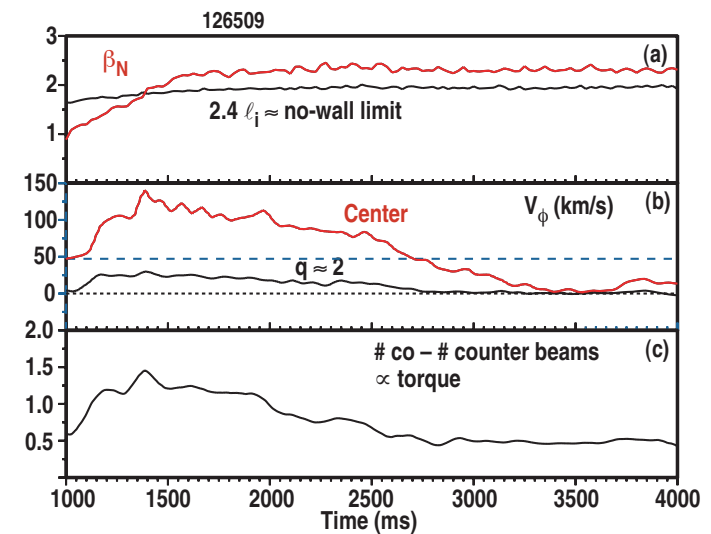


Fig. 2: Demonstration of sustained operation above no-wall limit at low plasma rotation. Dashed line in (b) shows typical previously observed threshold for v_ϕ at $q = 2$.